

SOIL EROSION ASSESSMENT IN *KIRINDI OYA* RIVER BASIN USING RUSLE MODEL

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Soil erosion is one of a main reasons for low productivity in upland farming while it is considered as a serious environmental issue. Identification of areas more prone to soil erosion is crucial in applying soil conservation measures, especially at river basin scale. *Kirindi Oya* river basin is one of the important river basins which supplies irrigation for the downstream Dry Zone of the Sri Lanka. This study was conducted to assess the soil erosion and generate soil erosion hazard map for *Kirindi Oya* basin using Revised Universal Soil Loss Equation (RUSLE) model in Arc GIS 10.2. The model requires to estimate rainfall-runoff erosivity factor (R), soil erodibility factor (K), slope length and steepness factor (LS), cover and management factor (C) and support and conservation practices factor (P). Rainfall-runoff erosivity factor (R) was calculated based on the monthly rainfall records of 13 rainfall stations and the values were interpolated to the basin using IDW technique. Soil map for the basin was digitized using the soil map developed by the Soil Science Society of Sri Lanka, while land use map for the basin were developed using the land use maps of Land Use Policy Planning Divisions of relevant districts. These maps were used to calculate the K, C and P factors. The LS factor was assessed by using the DEM generated from 30 m resolution ASTER data. Predicted soil erosion rates from RUSLE model ranged from 19.4 to 133.7 t ha⁻¹ yr⁻¹ for the entire river basin and it was higher than the acceptable soil loss tolerance. The results showed that 32.4% area of the river basin falls under low erosion (19.4 – 30 t ha⁻¹ yr⁻¹), 32.6% area lies under the moderate erosion (30 – 40 t ha⁻¹ yr⁻¹), 28.6% area falls under high erosion (40 – 50 t ha⁻¹ yr⁻¹), 4.8% area lies under very high erosion (50 - 60 t ha⁻¹ yr⁻¹) and 1.7% area falls under extremely high erosion (60 – 133 t ha⁻¹ yr⁻¹) classes. The study further revealed that majority of extremely vulnerable soil erosion areas belongs to *Badulla* and *Moneragala* districts of the basin and suggests immediate measures to conserve the soil.

Keywords: Geographic Information System (GIS), *Kirindi Oya*, Revised Universal Soil Loss Equation (RUSLE), Soil erosion, Soil erosion hazard map